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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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CONLEY ROSE, P.C. David A. Rose PO BOX 3267 HOUSTON, TX 77253-3267			EXAMINER ROST, ANDREW J	
			ART UNIT 3753	PAPER NUMBER
			MAIL DATE 01/09/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/525,926

Applicant(s)

BIESTER, KLAUS

Examiner

Andrew J. Rost

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3753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to the amendment filed 10/18/2007. Claims 1, 4, 6, 11, 15, 17, 18, 22 and 25-27 have been presently amended. Claim 28 has been canceled. No claims have been newly added. Presently, claims 1-27 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-7, 11, 13-15, 17-23 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. (6,585,246) in view of Howell (3,481,215).

Regarding claims 1, McCormick et al. disclose a regulating device having a ball spindle drive (ball nut 22 rotates a screw 24) with the ball nut being rotated by motor (14) through a first gear (18) connected to a ball nut assembly and a second gear (16) connected on the end of the motor drive shaft (17). McCormick et al. do not disclose the gears being self-locking, double helical gears. However, Howell teaches the use of self-locking double helical gears on parallel shafts with any desired gear ratio (col. 2, lines 3-6) in order for the drive train to completely prevent overshoot of the output and to provide almost perfect damping characteristics (col. 2, lines 27-29). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made

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to create the first and second gear of McCormick et al. as a double helical gear having self-locking characteristics as taught by Howell in order to prevent overshoot of the output and to provide almost perfect damping characteristics. The recitation "for operation of a blowout preventer" is the intended use of a regulating device. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations.

In regards to claim 2, McCormick et al. disclose a ball nut (22) that is allowed to rotate but is constrained from axial movement and the ball nut rotates and linearly translates a screw (24) to move an actuator.

In regards to claim 3, McCormick et al. disclose a rotating screw and actuating element are arranged along a common axis (fig. 1).

In regards to claim 4, the modified McCormick et al. reference discloses the ball nut connected to a first gear (18) while the motor is connected a second gear (16).

In regards to claim 5, McCormick et al. disclose an electric motor (col. 2, lines 25-26).

In regards to claims 6 and 7, the modified McCormick et al. reference discloses an additional second gear (34) that connects to the first gear and is operated by a second motor (32) with each motor having a drive shaft (17, 33) in parallel to the other drive shaft.

In regards to claims 11 and 27, the modified McCormick reference discloses a helical angle between 50° to 90°.

In regards to claim 13, McCormick et al. disclose the housing to be of a module design with the housing being flange-mounted (attached at flange extending from lower portion of housing in Fig. 1).

In regards to claim 14, McCormick et al. disclose the housing having a first module (upper portion of housing containing motors 14, 32 and ball nut 22) and a second module (lower portion of housing having screw 24 and stop collar 46).

In regards to claim 15, McCormick et al. disclose an intermediate cover (plate that gears 16, 34 are set on) that provides single-ended support of the second gears.

In regards to claim 17, McCormick et al. disclose the first gear mounted on the opposite side of the ball nut from the actuating element (Fig. 1).

In regards to claim 18, McCormick et al. disclose an intermediate ring (ball nut hub 20) placed between the ball nut and the first gear.

In regards to claim 19, McCormick et al. disclose bearing (40) to support the ball nut and retention ring (Fig. 1).

In regards to claim 20, McCormick et al. disclose the actuating element (element connected to the end of screw 24 opposite the ball nut) that is supported from rotating.

In regards to claim 21, McCormick et al. disclose the second motor (32) is wired in parallel to the first motor (14) and acts as a slave to provide additional torque (col. 2, lines 52-55).

In regards to claims 22, 25 and 26, the modified McCormick et al. reference discloses the second gear having differing amounts of teeth than the first gear producing a change in gear ratio. The modified McCormick et al. reference does not

expressly disclose a ratio of the teeth of the first gear to the teeth of the second gear to be 1 to 10, 1 to 7 or 1 to 4. The prior art recognizes the gear ratio as a results-effective variable, i.e. a variable that achieves a recognized result. In the instant case, the ratio of the teeth of the first gear to the teeth of the second gear should be adjusted to obtain a desired output on the actuating element from the input of the electric motors. Since the prior art recognizes this as a results-effective variable, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have chosen the gear ratio to be 1 to 10, 1 to 7, or 1 to 4, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (MPEP 2144.05).

In regards to claim 23, McCormick et al. disclose the motors operating together and are coupled to each other through the second and first gears.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. in view of Howell and further in view of Waber (6,095,487).

McCormick et al. in view of Howell discloses an actuator having a motor operating a second gear that rotates a first gear that rotates a ball nut to turn a screw to operate the actuator. The modified McCormick et al. reference does not disclose the use having at least two motors arranged on each drive shaft. However, Waber teaches the placement of a second motor on a drive shaft to operate a drive shaft for the purpose of compensating for position errors in the drive units (col. 1, lines 18-21). Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to place a second motor on the drive shafts of the modified McCormick et al. reference as taught by Waber in order to compensate for position errors in the drive units.

5. Claims 9-10 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. in view of Howell and further in view of Allen (5,722,304).

In regards to claims 9-10 and 24, the modified McCormick et al. reference discloses an actuator having a motor operating a second gear that rotates a first gear that rotates a ball nut to turn a screw to operate the actuator. The modified McCormick et al. reference does not disclose the use of a reduction gear. However, Allen teaches the use of a harmonic drive in a linear actuator because harmonic drives provide a high gear ratio, low backlash, high efficiency, long life and mounting simplicity (col. 3, lines 56-62). Therefore, it would have been obvious to provide the actuator of the modified McCormick et al. reference with the harmonic drive as taught by Allen in order to provide the actuator with a high gear ratio, low backlash, high efficiency and long life.

6. Claim 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. in view of Howell and further in view of Coppola et al. (5,743,348).

In regards to claim 12, the modified McCormick et al. reference discloses an actuator having a motor operating a second gear that rotates a first gear that rotates a ball nut to turn a screw to operate the actuator. The modified McCormick et al. reference does not expressly disclose a transmission ratio between 25 and 1. However, Coppola

et al. teach a transmission ratio of approximately 11.46 so that when the motor outputs 12,000 rpm, the speed is reduced to the order of 1,050 rpm in order to slow the rotation of the output shaft for improved control over the electric motor output (col. 5, lines 35-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the actuator of the modified McCormick et al. reference with a transmission ratio of 11.46 as taught by Coppola et al. in order to provide improved control over the output shaft.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. in view of Howell and further in view of Gilges et al. (5,370,011).

In regards to claim 16, the modified McCormick et al. reference discloses an actuator having a motor operating a second gear that rotates a first gear that rotates a ball nut to turn a screw to operate the actuator. The modified McCormick et al. reference does not disclose the placement of a position sensor in the housing. However, Gilges et al. teach the placement of a position sensor through an intermediate cover for the purpose of measuring the position of a control element and transmit a signal to the control system to adjust the position of the control element. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to place a sensor through an intermediate cover to measure the position of the rotating member of the modified McCormick et al. reference as taught by Gilges et al. in order to provide feedback and position control for the actuating element and rotating member.

Response to Arguments

8. Applicant's arguments filed 10/18/2007 have been fully considered but they are not persuasive.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that McCormick and Howell are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, McCormick teaches a regulating device that utilizes gearing in order to operate a ball spindle drive and Howell teaches gearing that has self-locking properties in order to provide almost perfect damping characteristics to a gearing system. Therefore, McCormick and Howell are analogous art.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew J. Rost whose telephone number is 571-272-2711. The examiner can normally be reached on 7:00 - 4:30 M-Th and 7:00 - 12:00 Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Huson can be reached on 571-272-4887. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJR, ASK 7 JANUARY 2008


RAMESH KIRSHNAMURTHY
PRIMARY EXAMINER